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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/790,627	03/01/2004	Brad N. Mathiowetz	P32.12-0022	1342

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WESTMAN CHAMPLIN & KELLY, P.A.
SUITE 1400
900 SECOND AVENUE SOUTH
MINNEAPOLIS, MN 55402

EXAMINER	
CHUO, TONY SHENG HSIANG	
ART UNIT	**PAPER NUMBER**
1729	
MAIL DATE	**DELIVERY MODE**
07/06/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/790,627	MATHIOWETZ ET AL.	
	Examiner	Art Unit	
	TONY CHUO	1729	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *27 April 2011*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-6* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6* is/are rejected.

7)☒ Claim(s) *1* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 5/26/11 has been entered.

Response to Amendment

2. Claims 1-6 are currently pending. Claims 7-35 are cancelled. The previous objection to claim 1 is withdrawn. The previously stated 112, 1st paragraph rejection of claims 1-7 is withdrawn. The amended claims do overcome the previously stated 103 rejections. However, upon further consideration, claims 1-6 are rejected under the following new 103 rejections.

Claim Objections

3. Claim 1 is objected to because of the following informalities: the term “elongate separate” in line 20 of page 2 should be changed to “elongated separation”. Appropriate correction is required.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Maggert et al (US 6724170), and further in view of Toyoda (JP 2001-243927).

Regarding claims 1-3 and 6, the Stafford reference discloses a battery pack comprising: a plurality of battery cells “22” wherein the battery cells are elongate and aligned parallel and side by side (Fig. 5); a plurality of electrical contacts “34” (electrical leads) that are capable of coupling the battery cells to an intrinsically safe hand held instrument (col. 4, lines 9-10); wherein housing support “26” comprises a plurality of opposed split shell segments “26a” and “26b” (first and second half shells) that contacts the cylindrical surface of the battery cells, wherein each split shell segments is positioned in physical contact with opposing side of one of the plurality of battery cell, wherein each split shell segments has a gap therebetween that is capable of allowing thermal expansion of the split shell segments (Fig. 1 and col. 4, lines 31-33); wherein the first and second half shells extend in parallel planes and enclosing the plurality of battery cells (Figs. 1 and 5); wherein each split shell segments “26a” & “26b” comprises: a first heat-conductor layer “42” (thermally conductive material/interior layer) that is shaped to conform to a cylindrical portion of the outer surface of the battery cells,

terminates at interior layer ends that are on the cylindrical portion of the outer surface of the battery cell, and has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K (col. 4, line 56 to col. 5, line 18 and Fig. 4); and a second structural support outer layer "48" (outer layer of thermally insulating material) that is shaped to conform to an outer surface of the first heat-conductor layer, contacts all of the outer surface of the first heat-conductor layer, extends beyond the outer surface to enclose the interior layer ends, defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, and has a thickness of 0.020 inches and a second value of thermal conductivity (col. 5 lines 23-26 and Fig. 4); and a structural base "60" (outer shell) covering the plurality of battery cells (Fig. 5).

Examiner's note: the recitation "for an intrinsically safe hand held portable instrument in an industrial process control system" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In addition, it is well known in the art that battery cells in a battery pack are connected to one another with a plurality of electrical interconnects. For example, Maggert et al (US 6724170) discloses electrical interconnects "110" that connect adjacent cells "101"-"104".

Further, it is the position of the examiner that “the interior layer of material spreads flow of the heat over a portion of the outer surface of the interior layer that is larger than the hot spot and the outer layer of material retards flow of the heat to an outer surface of the outer layer” and “the temperature of the outer surface of the outer layer has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition” are inherent properties of a battery cell that has a interior layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the battery cell and an outer layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the interior layer. In addition, the Stafford battery pack is also an intrinsically safe equipment because of the inherent properties of the battery housing support.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound (claim 1). The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal “16” (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film “18” (potting compound) (Fig. 9 and 13 and paragraphs [0206],[0211]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound in order to prevent overheating of

the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery.

However, Stafford et al as modified by Izaki et al does not expressly teach a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support, wherein the plurality of elongated separation bars are coupled to the outer shell (claim 1). The Maggert reference discloses a plurality of plastic casings “202”, “501”, “502” (elongated separation bars) positioned between the adjoining cells and between the plurality of electrical interconnects “110” to prevent shorting (col. 3 line 66 to col. 4 line 4). Examiner’s note: the Maggert plastic casings are capable of being couple to the outer shell of the battery pack.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery pack to include a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support, wherein the plurality of elongated separation bars are coupled to the outer shell in order to improve the safety of the battery by preventing the tabs from shorting to either tabs or other cell housings.

However, Stafford et al as modified by Izaki et al and Maggert et al does not expressly teach a plurality of outer elastic layers that comprises heat-shrink tubing (claims 1 and 6). The Toyoda reference discloses a heat shrink member “8” that is also an outer elastic layer that covers a battery (paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Maggert battery housing support to include a plurality of outer elastic layers that comprises heat-shrink tubing in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

6. Claims 1-3 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685) and Sato et al (US 5985480), and further in view of Toyoda (JP 2001-243927) and as evidenced by Maggert et al (US 6724170).

Regarding claims 1-3 and 6, the Stafford reference discloses a battery pack comprising: a plurality of battery cells “22” wherein the battery cells are elongate and aligned parallel and side by side (Fig. 5); a plurality of electrical contacts “34” (electrical leads) that are capable of coupling the battery cells to an intrinsically safe hand held instrument (col. 4, lines 9-10); wherein housing support “26” comprises a plurality of opposed split shell segments “26a” and “26b” (first and second half shells) that contacts the cylindrical surface of the battery cells, wherein each split shell segments is positioned in physical contact with opposing side of one of the plurality of battery cell, wherein each split shell segments has a gap therebetween that is capable of allowing thermal expansion of the split shell segments (Fig. 1 and col. 4, lines 31-33); wherein the first and second half shells extend in parallel planes and enclosing the plurality of battery cells (Figs. 1 and 5); wherein each split shell segments “26a” & “26b” comprises: a first heat-conductor layer “42” (thermally conductive material/interior layer) that is

shaped to conform to a cylindrical portion of the outer surface of the battery cells, terminates at interior layer ends that are on the cylindrical portion of the outer surface of the battery cell, and has a thickness of 0.04 inches and a thermal conductivity of 193 Watts/meter-°K (col. 4, line 56 to col. 5, line 18 and Fig. 4); and a second structural support outer layer "48" (outer layer of thermally insulating material) that is shaped to conform to an outer surface of the first heat-conductor layer, contacts all of the outer surface of the first heat-conductor layer, extends beyond the outer surface to enclose the interior layer ends, defines an exterior surface of the enclosure of the battery cells which separates the battery pack from the environment, and has a thickness of 0.020 inches and a second value of thermal conductivity (col. 5 lines 23-26 and Fig. 4); and a structural base "60" (outer shell) covering the plurality of battery cells (Fig. 5).

Examiner's note: the recitation "for an intrinsically safe hand held portable instrument in an industrial process control system" has not been given patentable weight because the recitation occurs in the preamble. A preamble is generally not accorded any patentable weight where it merely recites the purpose of a process or the intended use of a structure, and where the body of the claim does not depend on the preamble for completeness but, instead, the process steps or structural limitations are able to stand alone. See *In re Hirao*, 535 F.2d 67, 190 USPQ 15 (CCPA 1976) and *Kropa v. Robie*, 187 F.2d 150, 152, 88 USPQ 478, 481 (CCPA 1951).

In addition, it is well known in the art that battery cells in a battery pack are connected to one another with a plurality of electrical interconnects. For example,

Maggert et al (US 6724170) discloses electrical interconnects “110” that connect adjacent cells “101”-“104”.

Further, it is the position of the examiner that “the interior layer of material spreads flow of the heat over a portion of the outer surface of the interior layer that is larger than the hot spot and the outer layer of material retards flow of the heat to an outer surface of the outer layer” and “the temperature of the outer surface of the outer layer has a measured maximum temperature of 130 degrees centigrade or less during the short circuit condition” are inherent properties of a battery cell that has a interior layer of thermally conductive material that is shaped to conform to a cylindrical portion of an outer surface of the battery cell and an outer layer of thermally insulating material that is shaped to form an enclosure of an outer surface of the interior layer. In addition, the Stafford battery pack is also an intrinsically safe equipment because of the inherent properties of the battery housing support.

However, Stafford et al does not expressly teach a protective device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound (claim 1). The Izaki reference discloses a battery pack comprising: a plurality of batteries and a protective device including a fusible metal “16” (fusible link) coupled to a terminal "4" (connected lead) and the batteries, wherein the fusible metal is encased in a cover film “18” (potting compound) (Fig. 9 and 13 and paragraphs [0206],[0211]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford battery pack to include a protective

device including a fusible link coupled to a connected lead and the electrical energy storage cells which is encased in potting compound in order to prevent overheating of the battery during short circuiting by utilizing a fusible metal to break the circuit, thereby assuring safety of the battery.

However, Stafford et al as modified by Izaki et al does not expressly teach a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support, wherein the plurality of elongated separation bars are coupled to the outer shell (claim 1). The Sato reference discloses an insulating protector “9” (elongated separation bar) positioned between the neighboring cells and between the connecting bar “8” (electrical interconnect), wherein the insulating protector is coupled to the cap “14” (outer shell) (col. 6 lines 46-67 and Figs. 8 and 9).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki battery pack to include a plurality of elongated separation bars positioned between adjacent electrical energy storage cells and between the plurality of electrical interconnects to reduce shorting and provide mechanical support, wherein the plurality of elongated separation bars are coupled to the outer shell in order to improve the safety of the batteries by preventing short circuiting between the terminals of the batteries.

However, Stafford et al as modified by Izaki et al and Sato et al does not expressly teach a plurality of outer elastic layers that comprises heat-shrink tubing

(claims 1 and 6). The Toyoda reference discloses a heat shrink member “8” that is also an outer elastic layer that covers a battery (paragraph [0008]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Sato battery housing support to include a plurality of outer elastic layers that comprises heat-shrink tubing in order to improve the reliability of the outer package of the battery while preventing the generation of an outside short circuit.

7. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stafford et al (US 5763118) in view of Izaki et al (US 2002/0113685), Sato et al (US 5985480), and Toyoda (JP 2001-243927)as applied to claim 1 above, and further in view of Dansui et al (US 2003/0013009).

However, Stafford et al as modified by Izaki et al, Sato et al, and Toyoda does not expressly teach a first layer of material that comprises aluminum or copper (claims 4 and 5). The Dansui reference discloses a battery housing that is made of aluminum or copper (paragraph [0013]).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the Stafford/Izaki/Sato/Toyoda battery housing support to include a first layer of material that comprises aluminum or copper in order to utilize a material that has excellent thermal conduction properties and is suited for suppressing a battery temperature rise.

Response to Arguments

8. Applicant's arguments filed 4/27/11 have been fully considered but they are not persuasive.

The applicant argues the outer elastic layers have a lower thermal conductivity than the first and second half shells. This configuration is not shown in the cited references.

In response, the examiner would like to first point out that this argument is not commensurate with the scope of the claims. Claim 1 does not require outer elastic layers that have a lower thermal conductivity than the first and second half shells. Claim 1 only requires outer elastic layers of a thermally insulating material. In addition, the examiner contends that Stafford et al discloses outer layers that inherently have a lower thermal conductivity than the first and second half shells because the outer layers comprise a polymeric matrix that has a low thermal conductivity. In addition, Toyoda discloses an heat-shrink member that is an elastic material that can be substituted for the outer layers of the Stafford battery cells in order to provide a reliable outer package that insulates the outside surface of the battery cells and prevents short circuits.

The applicant argues that the amended claims include an outer shell which covers the plurality of electrical energy storage cells and is coupled to the plurality of elongate separation bars. The elongate separation bars reduce shorting between cells and provide mechanical support. This configuration is also not shown in the cited references.

In response, the examiner contends that Stafford et al discloses an outer shell that covers the plurality of battery cells and Maggert et al discloses a plurality of plastic casing “202” (elongated separation bars) that inherently reduce shorting between cell and provide mechanical support. In addition, the Maggert plastic casing (elongated separation bars) are capable of being coupled to the outer shell of the battery pack.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TONY CHUO whose telephone number is (571)272-0717. The examiner can normally be reached on M-F, 9:00AM to 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Ula Ruddock can be reached on (571) 272-1481. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.
TC

/ULA C. RUDDOCK/
Supervisory Patent Examiner, Art Unit 1729